Naval Facilities Engineering Command

ACTIVITY NAME

IR-03 Pilot Study Update

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Parcel E

Hunters Point Naval Shipyard

Contractor Integration Meeting

February 27, 2014

Location: HPNS IR03

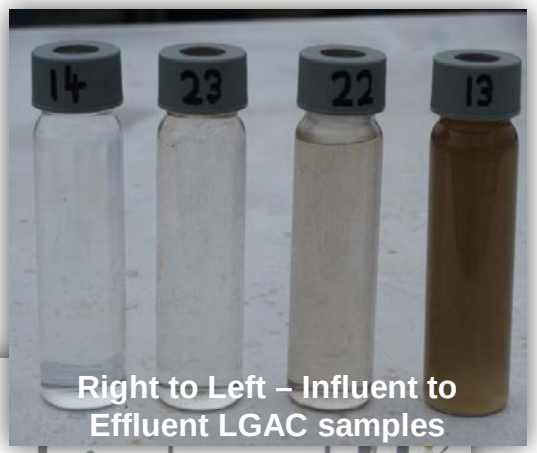
- **Nonaqueous phase liquid (NAPL) Treatment Pilot Study (NTPS):**

Activity	Schedule
In Situ Thermal Remediation (ISTR) Operation	February 4 – May 30, 2014
ISTR Performance Soil and Groundwater Sampling	June 2014
In Situ Solidification/Stabilization (ISS) Design – Draft to BCT	April 16, 2014

ISTR System Operation – February 4, 2014

ISTR Treatment System

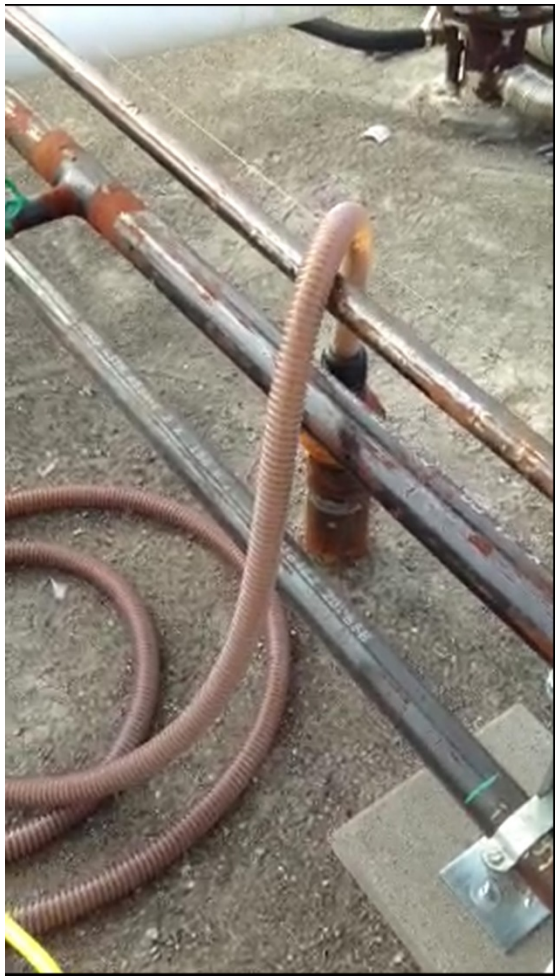
SVE and MPE knock-out vessels



Right to Left – Influent to Effluent LGAC samples

LGAC vessels with sampling ports

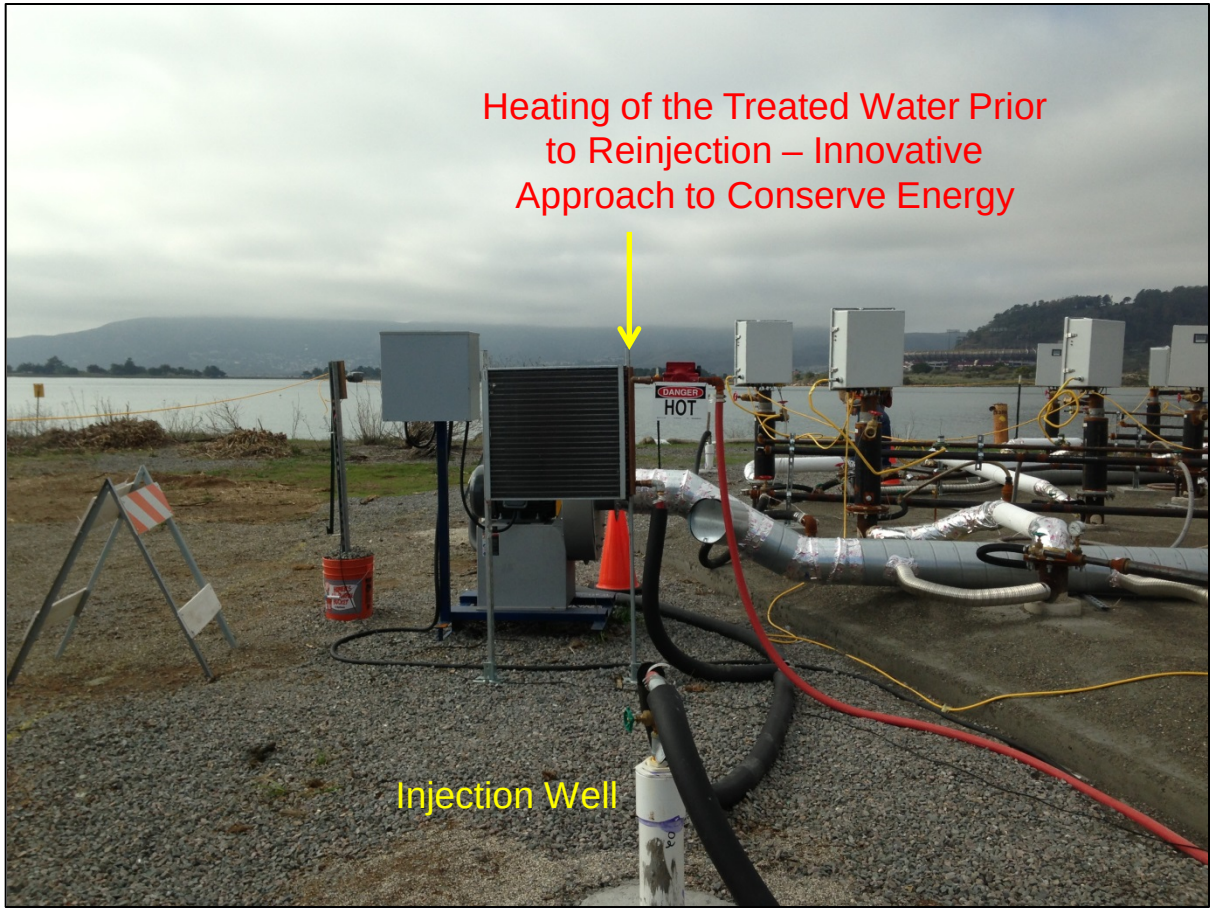
ISTR Extraction



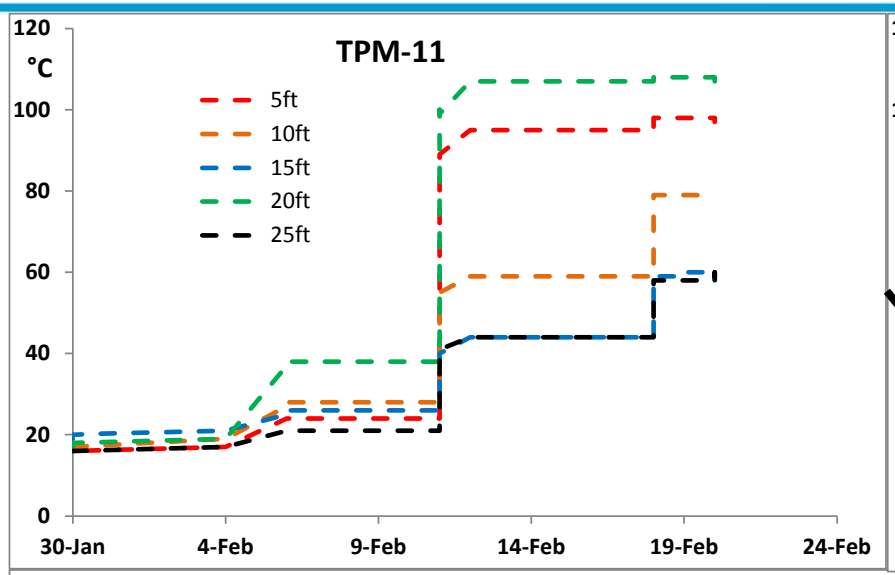
Multiphase Extraction (MPE) Well

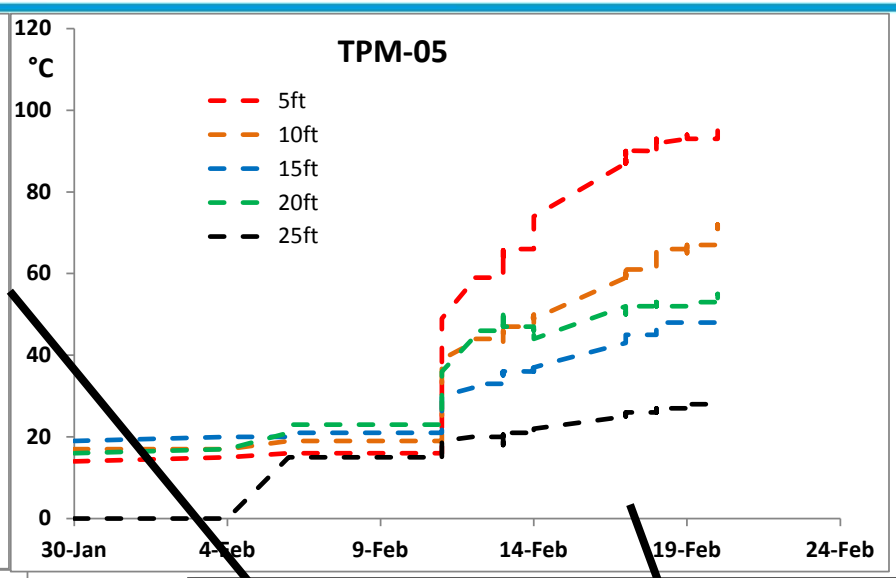
MPE Well in proximity to Thermal Conductive Heating Well

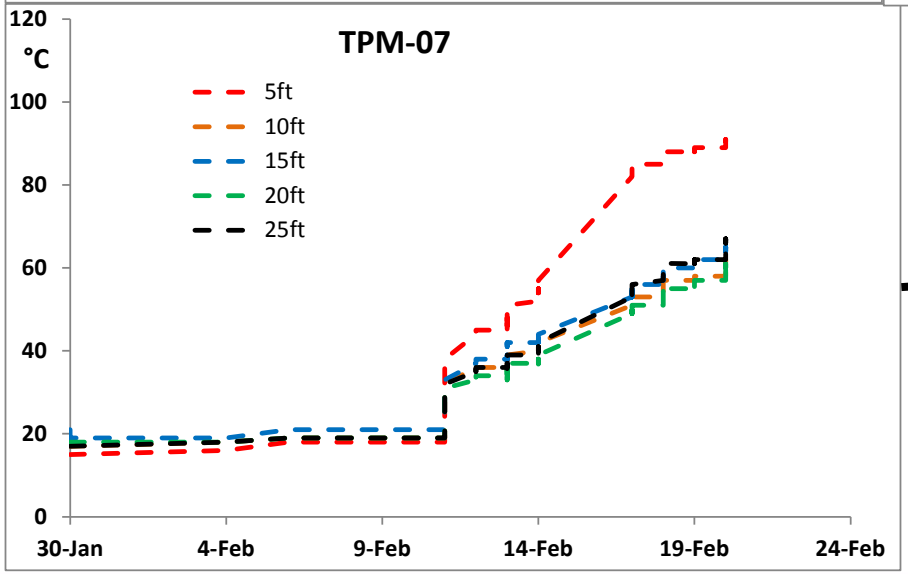
Innovative Approach to Increasing Efficiency of ISTR System - Reheating of Reinjection Water

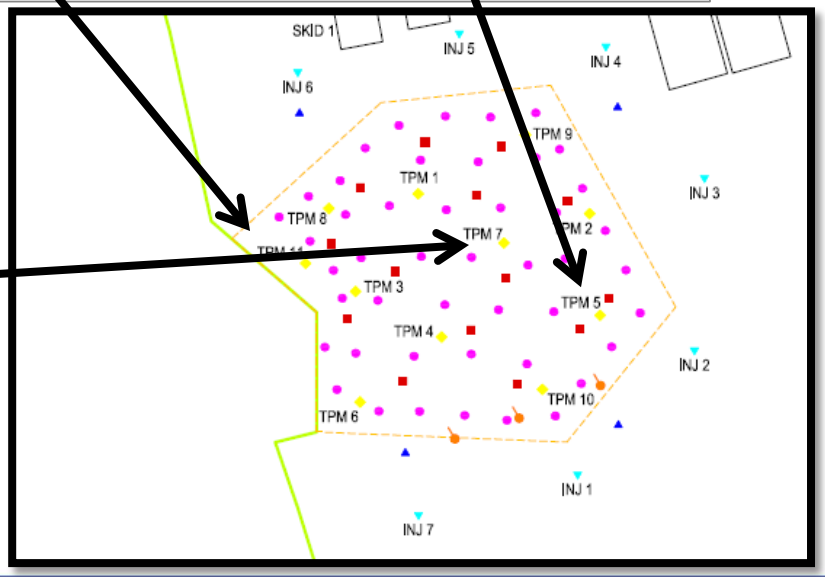


Temperatures in Treatment System

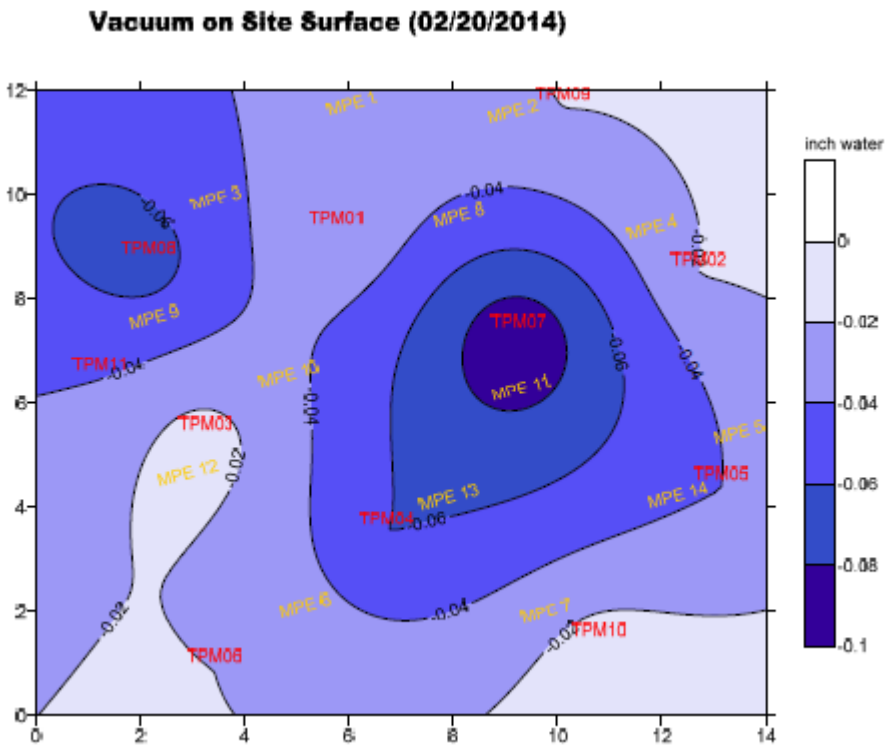


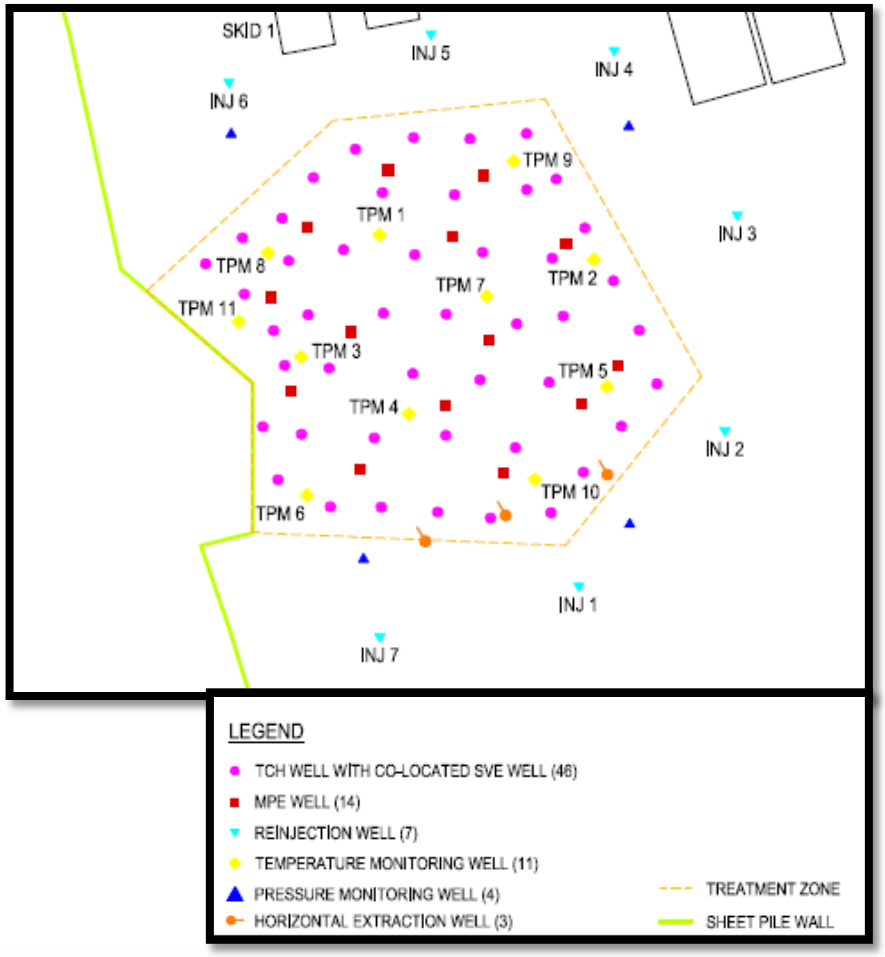




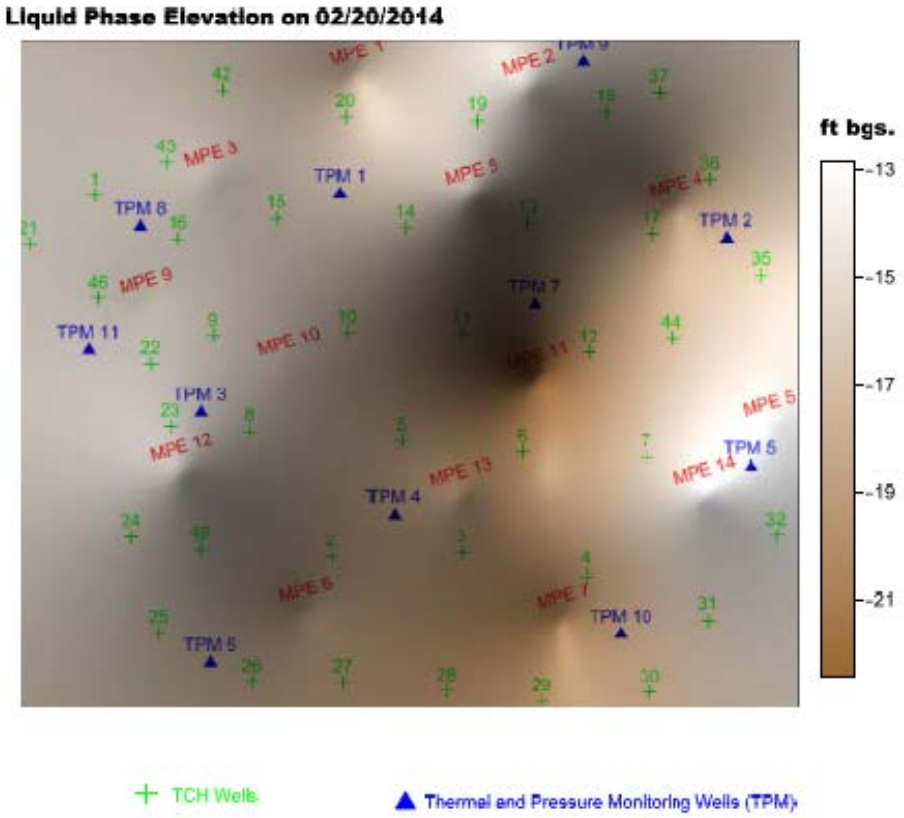


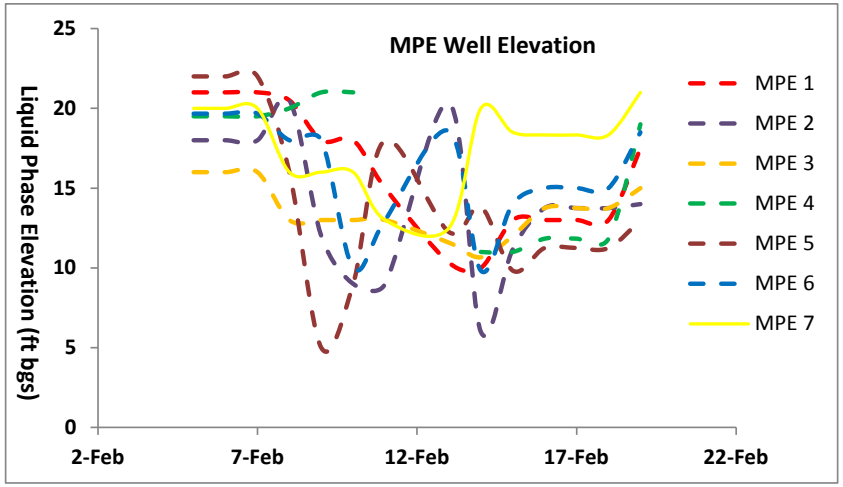
Pneumatic Control





Hydraulic Control



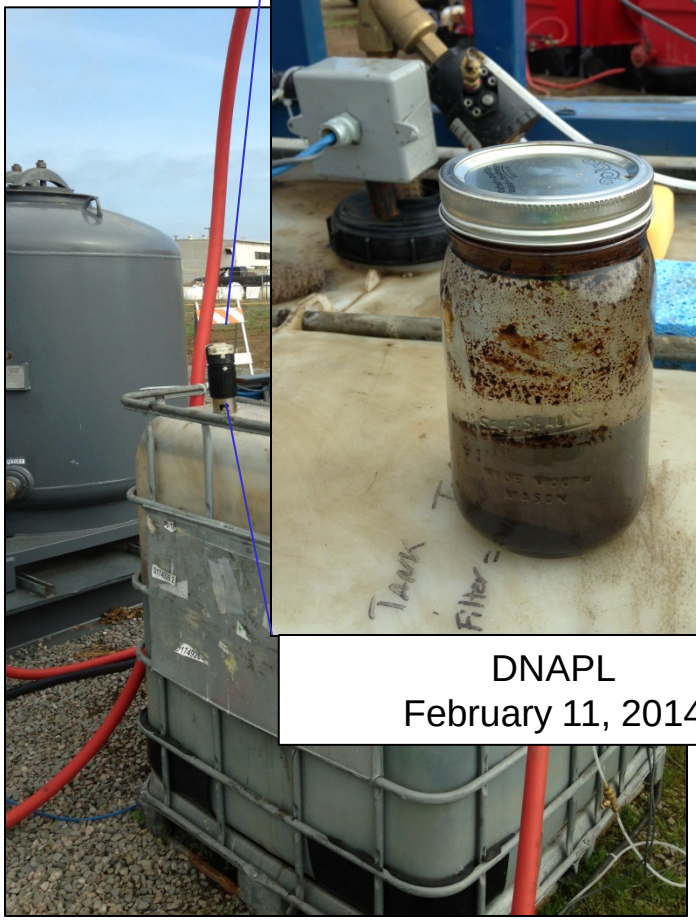


Hydraulic gradients towards ISTR zone have been established with MPE system.

Hydraulic modeling in process.

NAPL Extraction

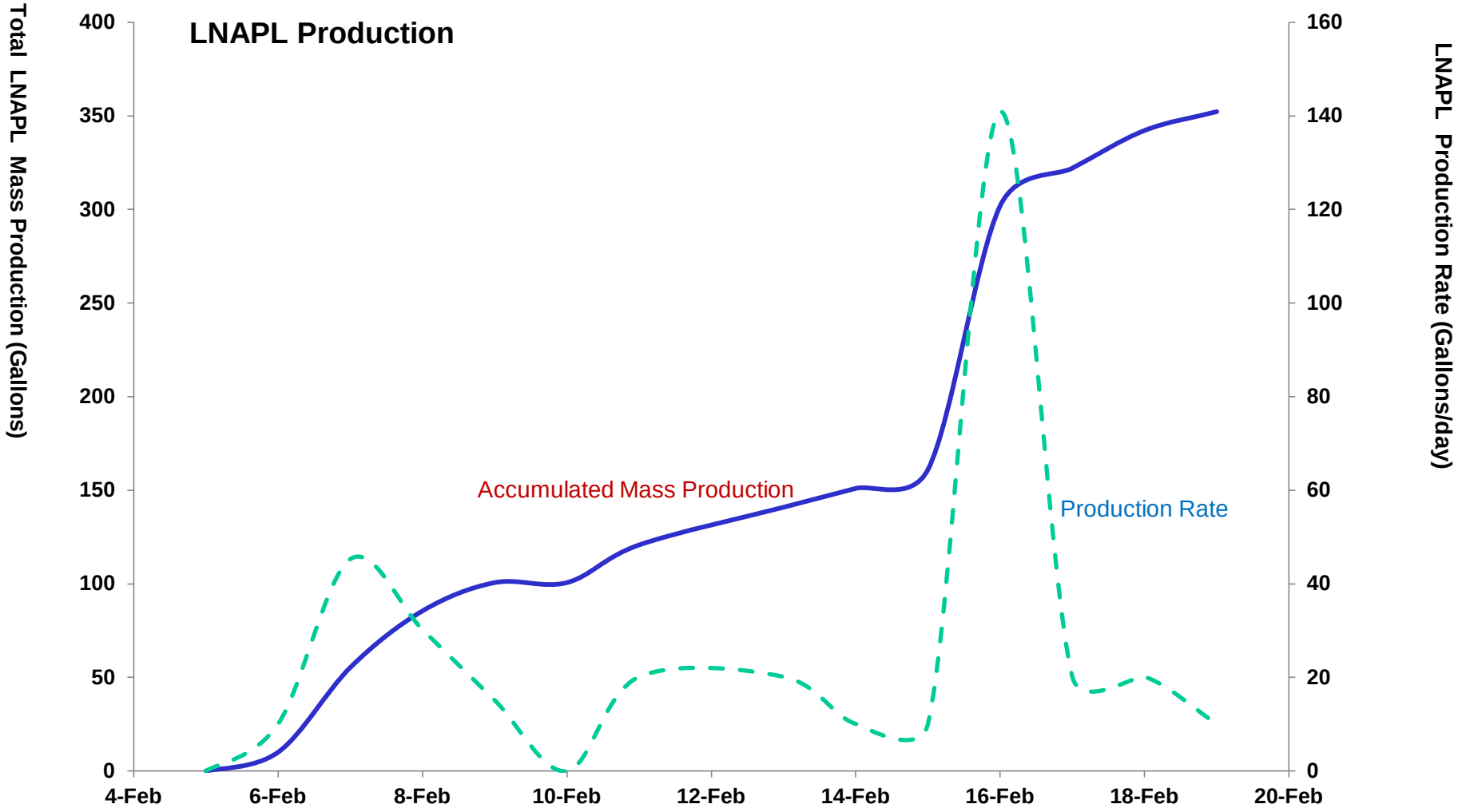
LNAPL
February 11, 2014



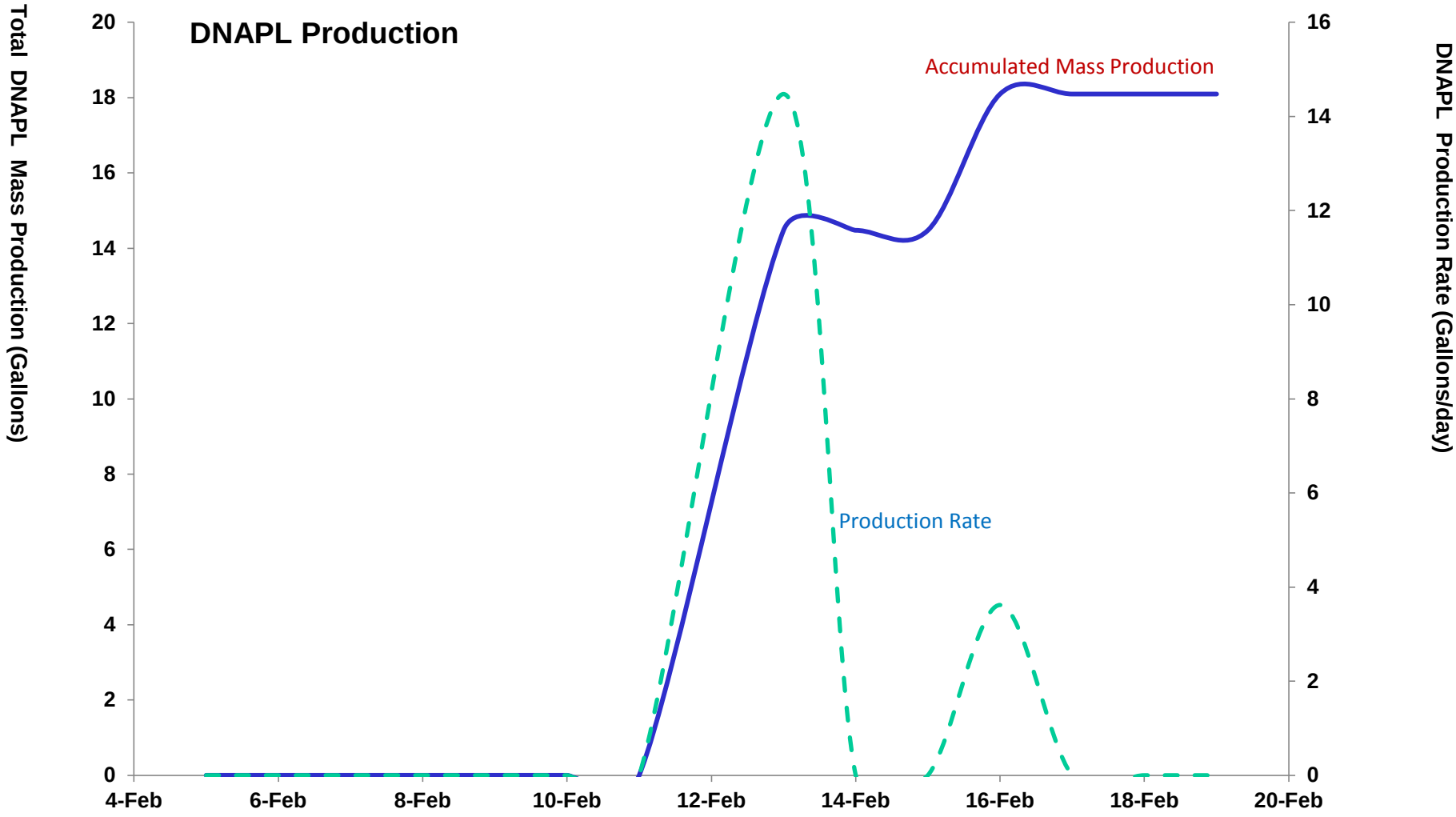
DNAPL
February 11, 2014

Sludge in Separator Tank – February 18, 2014

LNAPL Production



DNAPL Production



ISTR O&M Status and Observations – Part 1

- Daily temperature monitoring throughout the above ground system
  - **Observations:**
    - Week 1: Temperatures up to approximately 30-60 ºC in first week
    - Week 3 - Temperatures up to 70-90 ºC – Shut down some Heater Wells
  - **Conclusions:**
    - Reinjection of warm water (70 ºC) is allowing for the ISTR area to retain heat optimizing system
    - Optimization of well field in progress to maintain temperatures below 100 ºC
    - Result – NAPL is being extracted
    - Extraction/Injection Rates are maintained -Approximately 350 gallons/hour
- Daily pressure monitoring throughout the above ground treatment system
  - pressures have remained low
- Daily PID readings from the Vapor GAC influent and effluent
  - VGAC effluent below 1 ppm PID; TO-15 sample collected 02/14/2014

ISTR O&M Status and Observations – Part 2

- NAPL Volumes –
  - Approximately 370 gallons of NAPL extracted since February 4, 2014.
  - Approximately 90% of this is LNAPL.
- Weekly TPH Draeger tube measurements and Field GCMS of the Vapor GAC influent and effluent
  - Results have been non-detect to date
- Monthly TO-15 sampling of the Vapor GAC effluent
  - Sample 1 – results due February 28, 2014
- Weekly water sampling of the Liquid GAC influent and effluent
  - Baseline Sample – February 6, 2014
  - Month 1 Sample – March 3, 2014
- Weekly pH monitoring of the Liquid GAC influent
  - pH of LGAC – 6 (1st week); 7 (Weeks 2 and 3)
- Breathing zone monitoring 3 X a day – no readings above background